

What is claimed is:

1. A system for code division packet switching at an originating mobile subscriber terminal, said originating mobile subscriber terminal being located within a microport cell of a terrestrial wireless network at a given instant of time, where said network interfaces with an originating access radio port, comprising:

means for spreading a transmission signal by a PN-code assigned to a radio access port;

means for inserting an identifier of a few bits for identifying a user;

means for modulating said PN-code spread transmission signal;

means for forwarding said modulated PN-code spread transmission signal and marking a time origin of said forwarding of said modulated PN-code spread transmission signal;

means for receiving an acknowledgment, within a timeout period, from said originating access radio port, said acknowledgment comprising an assignment of an orthogonal code to said originating mobile subscriber terminal and a timing adjustment;

means for spreading a payload data signal by said assigned orthogonal code;

means for spreading the orthogonal spread payload data signal by the PN-code thereby associating the user with payload data;

means for modulating said twice spread payload data signal;

means for adjusting a transmission time by said timing adjustment received from said originating radio access port; and

means for forwarding said modulated twice spread payload data signal to said originating access radio port.

2. The system according to claim 1, wherein if no acknowledgment is received from said originating radio access port within said timeout period, said modulated PN-code spread transmission signal is forwarded again marking the time origin of said forwarding again.

3. The system according to claim 1, wherein said first means for spreading by said PN-code forms a preamble, which is prepended to a packet.

4. The system according to claim 1, wherein said orthogonal code is a Hadamard code.

5. A system for code division packet switching at an originating access radio port of a terrestrial wireless network, where said originating access radio port interfaces with a plurality of originating mobile subscriber terminals located within a microport cell of said terrestrial wireless network, comprising:

means for demodulating a transmission signal;

means for acquiring a preamble from said transmission signal;

means for acquiring a header from said transmission signal;

means for forwarding an acknowledgment to one of said plurality of said originating mobile subscriber terminals, said acknowledgment comprising an assignment of an orthogonal code to said one of said plurality of originating mobile subscriber terminals and a timing adjustment;

means for receiving a further transmission signal comprising payload data; and

means for despreading said further transmission signal by both said assigned orthogonal code and a PN-code.

6. The system according to claim 5, further comprising:

means for creating an ATM packet; and

means for forwarding said ATM packet through said network via an access node.

7. The system according to claim 5, wherein said orthogonal code sequence is a Hadamard code.

8. The system according to claim 6, further comprising means for releasing said assignment of said orthogonal code.

9. A system for code division packet switching at an originating mobile subscriber terminal, said originating mobile subscriber terminal being located within a microport cell of a terrestrial wireless network at a given instant in time, where said network interfaces with an originating radio access port, comprising:

means for spreading a transmission signal by a PN-code assigned to an access radio port;

means for inserting an identifier of a few bits for identifying a user;

means for modulating said PN-code spread transmission signal;

means for forwarding said modulated PN-code spread transmission signal and marking a time origin of said forwarding of said modulated PN-code spread transmission signal;

means for receiving an acknowledgment, within a timeout period, from said originating access radio port, said acknowledgment comprising an assignment of an orthogonal code to said originating mobile subscriber terminal and a timing adjustment;

means for spreading a payload data signal and an end of packet flag by said assigned orthogonal code;

means for spreading the orthogonal spread payload data signal and said end of packet flag by the PN-code thereby associating the user with payload data;

means for modulating said twice spread payload data signal and said end of packet flag;

means for adjusting a transmission time by said timing adjustment received from said originating radio access port; and

means for forwarding said modulated twice spread payload data signal and said end of packet flag to said originating access radio port.

10. The system according to claim 9, wherein if no acknowledgement is received from said originating radio access port within said timeout period, said modulated PN-code spread transmission signal is forwarded again marking the time origin of said forwarding again.

11. A system for code division packet switching at a destination radio access port of a terrestrial wireless network, where said destination radio access port interfaces with a plurality of destination mobile subscriber terminals located within a microport cell of said terrestrial wireless network, comprising:

means for transmitting a paging message to one of said plurality of destination mobile subscriber terminals over a paging channel indicating that there is payload data for said one of said plurality of destination mobile subscriber terminals;

means for receiving an acknowledgment from said one of said plurality of destination mobile subscriber terminals;

means for spreading said payload data extracted from an ATM packet with a uniquely assigned orthogonal code; and

means for transmitting said spread payload data to said one of said plurality of destination mobile subscriber terminals.

12. The system according to claim 11, further comprising:

means for waiting for a timeout period for a negative acknowledgement; and

means for releasing said uniquely assigned orthogonal code if no negative acknowledgment is received within said timeout period.

13. A system for code division packet switching at a destination mobile subscriber terminal, said destination mobile subscriber terminal being located within a microport cell of a terrestrial wireless network at a given instant in time, where said network interfaces with a destination radio access port, comprising:

means for monitoring a paging channel for paging messages indicating that there is payload data for said destination mobile subscriber terminal;

means for receiving a paging message via said paging channel;

means for transmitting an acknowledgment to said destination radio access port;

means for receiving twice spread payload data;

means for despreading said payload data using a uniquely assigned orthogonal code and a PN-code; and

means for decoding said despread payload data.

14. The system according to claim 13, further comprising means for presenting said payload data to a user.

15. The system according to claim 13, wherein said means for monitoring is accomplished by monitoring said paging channel using an arbitrary orthogonal code.

16. The system according to claim 13, wherein said acknowledgment comprises an assignment of a unique orthogonal code.

17. The system according to claim 13, further comprising means for switching, by said destination mobile subscriber terminal, to said uniquely assigned orthogonal code before despreading said twice spread payload data.

18. The system according to claim 5, wherein said network is an ATM network.

19. A system for code division packet switching at a destination access radio port of a terrestrial wireless network, where said destination access radio port interfaces with a plurality of destination mobile subscriber terminals located within a microport cell, comprising:

means for receiving a packet switched transmission signal from an access node via a network;

means for assigning a unique orthogonal code to one of said plurality of said destination mobile subscriber terminal;

means for spreading payload data destined for said one of said plurality of destination mobile subscriber terminals using both said uniquely assigned orthogonal code and a PN-code;

means for forwarding a paging message via a paging channel to said one of said plurality of said destination mobile subscriber terminals indicating that there is payload data destined for said one of said plurality of said destination mobile subscriber terminals;

means for receiving an acknowledgment from said one of said plurality of said destination mobile subscriber terminals;

means for modulating said twice spread payload data; and

means for transmitting said twice spread payload data over air to said one of said plurality of said destination mobile subscriber terminals.

20. A system for code division packet switching at a destination access radio port of a terrestrial wireless network, where said destination access radio port interfaces with a plurality of destination mobile subscriber terminals located within a microport cell, comprising:

- means for acquiring a preamble and a header, which has a PN-code;
- means for processing said PN-code to insure synchronization;
- means for sending an acknowledgement; and
- means for receiving payload data.

21. The system according to claim 20, wherein said preamble is acquired using a serial/parallel acquisition circuit.

22. The system according to claim 21, wherein said synchronization is made to a standard reference time maintained by said destination access radio port.

23. The system according to claim 20, wherein said payload data are received by despreading by a unique orthogonal code and said PN-code.

24. A system for code division packet switching used for interfacing a terrestrial wireless network with a packet switched network, where said wireless network interfaces with a plurality of radio access ports, each of said radio access ports interfacing to a plurality of mobile subscriber terminals, comprising:



means for spreading, by said originating mobile subscriber terminal, a transmission signal by a PN-code assigned to an intended receiving port;

means for inserting, by said originating mobile subscriber terminal, an identifier of a few bits for identifying a user;

means for modulating, by said originating mobile subscriber terminal, said PN-code spread transmission signal;

means for forwarding, by said originating mobile subscriber terminal, said modulating PN-code spread transmission signal and marking the time origin of said forwarding;

means for demodulating, by said originating access radio port, said modulated PN-code spread transmission signal;

means for acquiring, by said originating access radio port, a preamble from said transmitted signal;

means for despreading, by said originating access radio port, a header from transmitted signal;

means for forwarding, by said originating access radio port, an acknowledgment to one of said plurality of said originating mobile subscriber terminals, said acknowledgment comprising an assignment of an orthogonal code to said one of said plurality of originating mobile subscriber terminals and a timing adjustment;

means for receiving, by said originating mobile subscriber terminal, said acknowledgment, within a timeout period, from said originating access radio port,;

means for spreading, by said originating mobile subscriber terminal, a payload data signal by said assigned orthogonal code;

means for spreading, by said originating mobile subscriber terminal, the orthogonal spread payload data signal by the PN-code associating the user with payload data;

means for modulating, by said originating mobile subscriber terminal, said twice spread payload data signal;

means for adjusting, by said originating mobile subscriber terminal, a transmission time by said timing adjustment received from said originating radio access port;

means for forwarding, by said mobile subscriber terminal, said modulated twice spread payload data signal to said originating access radio port;

means for receiving, by said originating access radio port, a further transmission signal comprising payload data;

means for despreading said further transmission signal by both said assigned orthogonal code and said PN-code;

means for monitoring, by a destination mobile subscriber terminal, a paging channel for paging messages indicating that there is payload data for said destination mobile subscriber terminal;

means for transmitting, by a destination access radio port, said paging message to a destination mobile subscriber terminal over said paging channel indicating that there is payload data for one of said plurality of destination mobile subscriber terminals;

means for receiving, by said destination mobile subscriber terminal, said paging message via said paging channel;

means for transmitting, by said destination mobile subscriber terminal, an acknowledgment to said destination radio access port;

means for receiving, by said destination access radio port, said acknowledgment from said one of said plurality of destination mobile subscriber terminals;

means for spreading, by said destination access radio port, said payload data extracted from an ATM packet with a uniquely assigned orthogonal code and with said PN-code;

means for transmitting, by said destination access radio port, said twice spread payload data to said one of said plurality of destination mobile subscriber terminals;

means for receiving, by said destination mobile subscriber terminal, said twice spread payload data;

means for despreading, by said destination mobile subscriber terminal, said payload data using said uniquely assigned orthogonal code and said PN-code; and

means for decoding, by said destination mobile subscriber terminal, said despread payload data.

25. The system according to claim 24, further comprising the step of presenting, by said destination mobile subscriber terminal, said payload data to a user.

26. A system for code division packet switching used for interfacing a terrestrial wireless network with a packet switched network, where said wireless network interfaces with a plurality of radio access ports, each of said radio access ports interfacing to a plurality of mobile subscriber terminals, comprising:

means for spreading, by said originating mobile subscriber terminal, a transmission signal by a PN-code assigned to an intended receiving port;

means for inserting, by said originating mobile subscriber terminal, an identifier of a few bits for identifying a user;

means for modulating, by said originating mobile subscriber terminal, said PN-code spread transmission signal;

means for forwarding, by said originating mobile subscriber terminal, said modulating PN-code spread transmission signal and marking the time origin of said forwarding;

means for demodulating, by said originating access radio port, said modulated PN-code spread transmission signal;

means for acquiring, by said originating access radio port, a preamble from said transmitted signal;

means for despreading, by said originating access radio port, a header from transmitted signal;

means for forwarding, by said originating access radio port, an acknowledgment to one of said plurality of said originating mobile subscriber terminals, said acknowledgment comprising an assignment of an orthogonal code to said one of said plurality of originating mobile subscriber terminals and a timing adjustment;

means for receiving, by said originating mobile subscriber terminal, said acknowledgment, within a timeout period, from said originating access radio port;

means for spreading, by said originating mobile subscriber terminal, a payload data signal by said assigned orthogonal code;

means for spreading, by said originating mobile subscriber terminal, the orthogonal spread payload data signal by the PN-code associating the user with payload data;

means for modulating, by said originating mobile subscriber terminal, said twice spread payload data signal;

means for adjusting, by said originating mobile subscriber terminal, a transmission time by said timing adjustment received from said originating radio access port;

means for forwarding, by said originating mobile subscriber terminal, said modulated twice spread payload data signal to said originating access radio port;

means for receiving, by said originating access radio port, a further transmission signal comprising payload data;

means for despreading, by said originating access radio port, said further transmission signal by both said assigned orthogonal code and said PN-code;

means for monitoring, by a destination mobile subscriber terminal, a paging channel for paging messages indicating that there is payload data for said destination mobile subscriber terminal;

means for receiving, by said destination radio access port, said packet switch transmission signal from an access node via a network;

means for assigning, by said destination access radio port, a unique orthogonal code to one of said plurality of said destination mobile subscriber terminal;

means for spreading, by said destination access radio port, payload data destined for said one of said plurality of destination mobile subscriber terminals using both said uniquely assigned orthogonal code and a PN-code;

means for transmitting, by a destination access radio port, said paging message to said one of said plurality of said destination mobile subscriber terminals over said paging channel indicating that there is payload data for one of said plurality of destination mobile subscriber terminals;

means for receiving, by said destination mobile subscriber terminal, said paging message via said paging channel;

means for transmitting, by said destination mobile subscriber terminal, an acknowledgment to said destination radio access port;

means for receiving, by said destination access radio port, said acknowledgment from said one of said plurality of destination mobile subscriber terminals;

means for spreading, by said destination access radio port, said payload data extracted from an ATM packet with a uniquely assigned orthogonal code and with said PN-code;

means for modulating, by said destination access radio port, said twice spread payload data;

means for transmitting, by said destination access radio port, said twice spread payload data over air to said one of said plurality of destination mobile subscriber terminals;

means for receiving, by said destination mobile subscriber terminal, said twice spread payload data;

means for despreading, by said destination mobile subscriber terminal, said payload data using said uniquely assigned orthogonal code and said PN-code; and

means for decoding, by said destination mobile subscriber terminal, said despread payload data.

27. The system according to claim 26, further comprising means for presenting, by said destination mobile subscriber terminal, said payload data to a user.

28. The system according to claim 5, wherein said first means for spreading by said PN-code forms a preamble, which is prepended to a packet.

29. The system according to claim 9, wherein said first means for spreading by said PN-code forms a preamble, which is prepended to a packet.

30. The system according to claim 24, wherein said first means for spreading by said PN-code forms a preamble, which is prepended to a packet.

31. The system according to claim 26, wherein said first means for spreading by said PN-code forms a preamble, which is prepended to a packet.

32. A system for code division packet switching at an originating mobile subscriber terminal, said originating mobile subscriber terminal being located within a microport cell of a terrestrial wireless network at a given instant of time, where said network interfaces with an originating access radio port, comprising:

means for spreading a preamble by a PN-code assigned to a radio access port;

means for inserting an identifier of a few bits for identifying a user;

means for modulating said PN-code spread transmission signal;

means for forwarding said modulated PN-code spread transmission signal and marking a time origin of said forwarding of said modulated PN-code spread transmission signal;

means for receiving an acknowledgment, within a timeout period, from said originating access radio port, said acknowledgment comprising an assignment of an orthogonal code to said originating mobile subscriber terminal and a timing adjustment;

means for spreading a payload data signal by said assigned orthogonal code;

means for spreading the orthogonal spread payload data signal by the PN-code thereby associating the user with payload data;

means for modulating said twice spread payload data signal;

means for adjusting a transmission time by said timing adjustment received from said originating radio access port; and

means for forwarding said modulated twice spread payload data signal to said originating access radio port.

33. The system according to claim 32, wherein said first spreading means and said second spreading means are accomplished using a spreader comprising:

a first multiplier used to spread said payload data by said assigned orthogonal code;



a second multiplier used to spread said preamble, said header and said payload data by said PN-code; and

a switch used to alternate between said first multiplier and said second multiplier thereby spreading said preamble and said header by said PN-code only and spreading said payload data by both said assigned orthogonal code and said PN-code.

34. A system for code division packet switching used for interfacing a terrestrial wireless network with a packet switched network, where said wireless network interfaces with a plurality of radio access ports, each of said radio access ports interfacing to a plurality of mobile subscriber terminals, comprising:

means for spreading, by said originating mobile subscriber terminal, a preamble and a header signal by a PN-code assigned to an intended receiving port;

means for inserting, by said originating mobile subscriber terminal, an identifier of a few bits for identifying a user;

means for modulating, by said originating mobile subscriber terminal, said PN-code spread transmission signal;

means for forwarding, by said originating mobile subscriber terminal, said modulating PN-code spread transmission signal and marking the time origin of said forwarding;

means for demodulating, by said originating access radio port, said modulated PN-code spread transmission signal;

means for acquiring, by said originating access radio port, a preamble from said transmitted signal;

means for despreading, by said originating access radio port, a header from transmitted signal;

means for forwarding, by said originating access radio port, an acknowledgment to one of said plurality of said originating mobile subscriber terminals, said acknowledgement comprising an assignment of an orthogonal code to said one of said plurality of originating mobile subscriber terminals and a timing adjustment;

means for receiving, by said originating mobile subscriber terminal, said acknowledgment, within a timeout period, from said originating access radio port;

means for spreading, by said originating mobile subscriber terminal, a payload data signal by said assigned orthogonal code;

means for spreading, by said originating mobile subscriber terminal, the orthogonal spread payload data signal by the PN-code associating the user with payload data;

means for modulating, by said originating mobile subscriber terminal, said twice spread payload data signal;

means for adjusting, by said originating mobile subscriber terminal, a transmission time by said timing adjustment received from said originating radio access port;

means for forwarding, by said originating mobile subscriber terminal, said modulated twice spread payload data signal to said originating access radio port;

means for receiving, by said originating access radio port, a further transmission signal comprising payload data;

means for disspreading, by said originating access radio port, said further transmission signal by both said assigned orthogonal code and said PN-code;

means for monitoring, by a destination mobile subscriber terminal, a paging channel for paging messages indicating that there is payload data for said destination mobile subscriber terminal;

means for receiving, by said destination radio access port, said packet switch transmission signal from an access node via a network;

means for assigning, by said destination access radio port, a unique orthogonal code to one of said plurality of said destination mobile subscriber terminals;

means for spreading, by said destination access radio port, payload data destined for said one of said plurality of destination mobile subscriber terminals using both said uniquely assigned orthogonal code and a PN-code;

means for transmitting, by a destination access radio port, said paging message to said one of said plurality of said destination mobile subscriber terminals over said paging channel indicating that there is payload data for one of said plurality of destination mobile subscriber terminals;

means for receiving, by said destination mobile subscriber terminal; said paging message via said paging channel;

means for transmitting, by said destination mobile subscriber terminal, an acknowledgement to said destination radio access port;

means for receiving, by said destination access radio port, said acknowledgement from said one of said plurality of destination mobile subscriber terminals;

means for spreading, by said destination access radio port, said payload data extracted from an ATM packet with a uniquely assigned orthogonal code and with said PN-code;

means for modulating, by said destination access radio port, said twice spread payload data;

means for transmitting, by said destination access radio port, said twice spread payload data over air to one of said plurality of destination mobile subscriber terminals;

means for receiving, by said destination mobile subscriber terminal, said twice spread payload data;

means for despreading, by said destination mobile subscriber terminal; said payload data using said uniquely assigned orthogonal code and said PN-code; and

means for decoding, by said destination mobile subscriber terminal, said despread payload data.

35. The system according to claim 34, wherein said first spreading means and said second spreading means are accomplished using a spreader comprising:

a first multiplier used to spread said payload data by said assigned orthogonal code;

a second multiplier used to spread said preamble, said header and said payload data by said PN-code; and

a switch used to alternate between said first multiplier and said second multiplier thereby spreading said preamble and said header by said PN-code only and spreading said payload data by both said assigned orthogonal code and said PN-code.